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ABSTRACT

The National Household Education Survey (NHES) is a telephone survey of the noninstitutionalized civilian population of the United States that collects data on educational issues that are best explored through contact with households rather than with institutions. The NHES has been conducted in 1991, 1993, 1995, and 1996. In the 1996 NHES (NHES:96), the topical components were parent/family involvement in education and civic involvement. The 1996 expanded screener feature included a set of questions on public library use. This working paper presents information on the potential for undercoverage bias in estimates from the NHES:96. Estimates from the NHES:96 are subject to bias because only households with telephones were sampled. Data from the October 1994 and November 1994 Current Population Survey of the Bureau of the Census are used to estimate the potential size of the undercoverage bias of the estimates. The analysis shows that the coverage biases for estimates of household characteristics are not very large. For estimates of voter participation of adults, the coverage biases are somewhat larger. This is due mainly to extreme differences in voter participation characteristics between adults in telephone and nontelephone households. For the adult civic involvement questions in the NHES:96, the differences may not be so large. However, undercoverage bias for some subgroups in the NHES:96 may be problematic, since coverage biases for Black households and persons, and, to a lesser extent, Hispanic households and persons, were larger than for the population as a whole. Overall, findings about the NHES:96 support the use of telephone data collection as a cost-effective survey procedure. An appendix contains nine tables from the analyses. (Contains 11 references.) (SLD)

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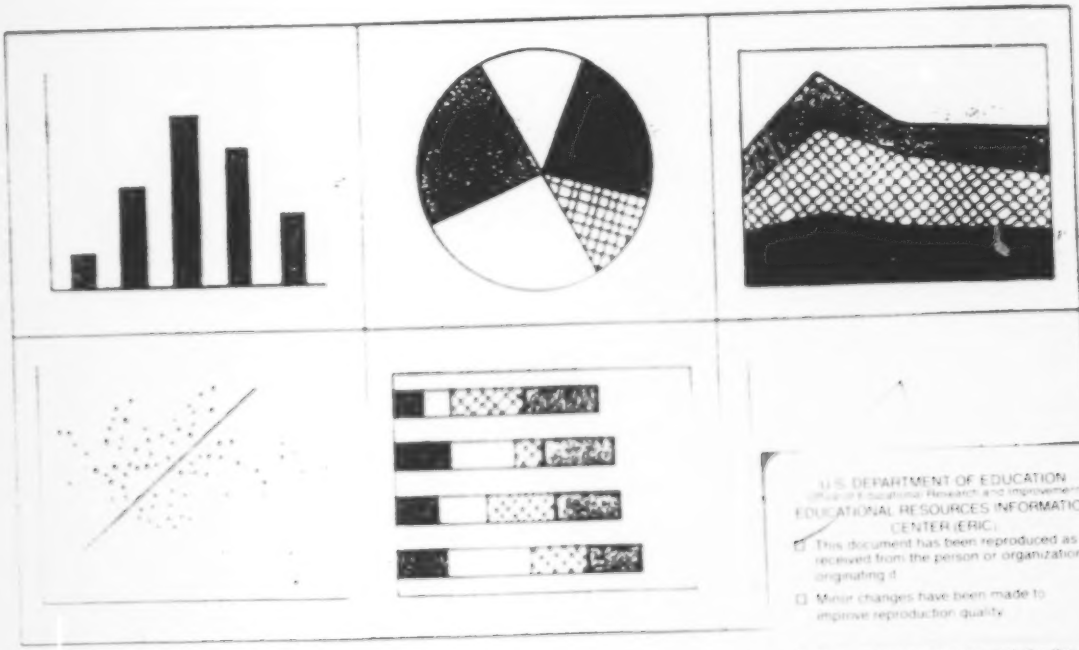

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Undercoverage Bias in Estimates of Characteristics of Households and Adults in the 1996 National Household Education Survey

Working Paper No. 97-39 November 1997

Contact: Kathryn Chandler
Surveys and Cooperative Systems Group
(202) 219-1767
e-mail: NHES@ed.gov
http://www.ed.gov/NCES/NHES

U.S. Department of Education
Richard W. Riley
Secretary

Office of Educational Research and Improvement
Ricky T. Takai
Acting Assistant Secretary

National Center for Education Statistics
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November 1997

Foreword

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Samuel S. Peng
Acting Director
Statistical Standards and Services Group

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Prepared by:

Jill M. Montaquila
J. Michael Brick
Shelley P. Brock

Westat, Inc.

Prepared for:

U.S. Department of Education
Office of Educational Research and Development
National Center for Education Statistics

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1. Background

The National Household Education Survey (NHES) is a data collection system of the National Center for Education Statistics (NCES), which has as its legislative mission the collection and publication of data on the condition of education in the Nation. The NHES is specifically designed to support this mission by providing information on those educational issues that are best addressed by contacting households rather than schools or other educational institutions. The NHES provides descriptive data on the educational activities of the U.S. population and offers policymakers, researchers, and educators a variety of statistics on the condition of education in the United States.

The NHES is a telephone survey of the noninstitutionalized civilian population of the U.S. Households are selected for the survey using random digit dialing (RDD) methods, and data are collected using computer-assisted telephone interviewing (CATI) procedures. Approximately 45,000 to 60,000 households are screened for each administration, and individuals within households who meet predetermined criteria are sampled for more detailed or extended interviews. The data are weighted to permit estimates of the entire population. The NHES survey for a given year typically consists of a Screener, which collects household composition and demographic data, and extended interviews on two substantive components addressing education-related topics. In order to assess data item reliability and inform future NHES surveys, each administration also includes a subsample of respondents for a reinterview.

Throughout its history, the NHES has collected data in ways that permit estimates to be tracked across time. This includes repeating topical components on a rotating basis in order to provide comparative data across survey years. In addition, each administration of the NHES has benefited from experiences with previous cycles, resulting in enhancements to the survey procedures and content. Thus, while the survey affords the opportunity for tracking phenomena across time, it is also dynamic in addressing new issues and including conceptual and methodological refinements.

A new design feature of the NHES program implemented in the NHES:96 is the collection of demographic and educational information on members of all screened households, rather than just those households potentially eligible for a topical component. In addition, this expanded screening feature included a brief set of questions on an issue of interest to education program administrators or policymakers. The total Screener sample size was sufficient to produce state estimates of household characteristics for the NHES:96.

The NHES has been conducted in 1991, 1993, 1995, and 1996. Topics addressed by the NHES:91 were early childhood education and adult education. The NHES:93 collected information about school readiness and school safety and discipline. The 1991 components were repeated for the NHES:95, addressing early childhood program participation and adult education. Both components underwent substantial redesign to incorporate new issues and develop new measurement approaches. In the NHES:96, the topical components were parent/family involvement in education and civic involvement. The NHES:96 expanded screening feature included a set of questions on public library use.

In addition to its topical components, the NHES system has also included a number of methodological investigations. These have resulted in technical reports and working papers covering diverse topics such as telephone undercoverage bias, proxy reporting, and sampling methods. This series of technical reports and working papers provides valuable information on ways of improving the NHES and other RDD telephone surveys more generally.

This working paper presents information on the potential for undercoverage bias in estimates from 1996 National Household Education Survey (NHES:96) data. Readers may also wish to review other NHES:96 working papers: *Unit and Item Response Rates, Weighting, and Imputation Procedures in the 1996 National Household Education Survey* (Montaquila and Brick 1997), *Design, Data Collection, Interview Administration Time, and Data Editing in the 1996 National Household Education Survey* (Vaden-Kiernan et al. 1997), and *Comparison of Estimates from the 1996 National Household Education Survey* (Nolin et al. 1997).

Purpose and Overview of Report

The estimates from the National Household Education Survey of 1996 (NHES:96) are subject to bias because only households with telephones were sampled. Data from the October 1994 and November 1994 Current Population Survey (CPS) are used in this report to evaluate the potential size of the undercoverage bias of the estimates. Since weighting adjustments are used in the NHES:96 with the goal of reducing this coverage bias, the findings in this report also provide an evaluation of the effectiveness of these adjustments.

This report continues research on telephone coverage bias in estimates from the NHES that began with the Field Test of 1989 (Brick et al. 1992). Other research was conducted for the NHES:91 (Brick 1992), the NHES:93 (Brick and Tubbs 1996), and the NHES:95 (Brick 1996). The focus of this report is on the statistics for two separate populations: Households that were sampled for Screening

interviews (including information obtained from the Screener about persons living in these households) and civilian adults who were sampled for the Adult Civic Involvement (CI) component. Children 3 years old through 12th grade were sampled for the Parent PFI/CI and Youth CI components, but previous undercoverage bias research was already conducted for children using data from the CPS (Brick et al. 1992, Brick and Tubbs 1996).

The rationale for using the CPS data to estimate the potential bias in statistics from the NHES is the same as used in the previous reports. The October 1994 CPS was used to examine coverage bias in estimates of characteristics of households because it contains items similar to those in the NHES:96 Screener and was administered to both telephone and nontelephone households. The November 1994 CPS Voting and Registration Supplement was used to examine coverage bias in the NHES:96 Adult CI component because it contained items on civic involvement and was administered to both telephone and nontelephone households.

2. Telephone Coverage and Bias

The NHES:96 was a random-digit-dial telephone survey and only included persons who lived in households with telephones. Approximately 6 percent of all persons live in households without telephones, according to data from the October 1994 CPS. The percentage of persons who live in households with telephones varies somewhat by characteristics of the populations considered. For example, while 95 percent of all adults (age 18 years and over) live in telephone households, only 88 percent of black adults and 87 percent of Hispanic adults live in telephone households, based on these CPS data. These differences in coverage rates by characteristics of the population is one of the factors that leads to biases in statistics based on data collected from persons in telephone households only.

The term bias has a specific technical definition in this context. Bias is the expected difference between the estimates from the survey and the actual population value. For example, if all telephone households were included in the survey and responded to the required interviews, the difference between the estimate from the survey and the actual population value (which includes the responses of persons living in nontelephone households) is the bias due to incomplete coverage. Since the NHES is based on a sample, the bias is defined as the expected or average value of this difference over all possible samples.

Coverage bias, the bias due to failure to include all persons in the sample, can be substantial when two conditions hold. First, the differences between the characteristics in covered population and

the uncovered population must be relatively large. For example, consider estimating the percentage of persons taking part in a given type of civic activity. If the percentage is nearly identical in both the covered and uncovered population, then the bias for the estimate will be negligible.

Second, the proportion of the population that is not covered by the survey must be large compared to the size of the estimates. If only 2 percent of the population is not covered, estimates of totals that comprise 20 or 30 percent of the population will not be greatly affected, even if the differences in the characteristics between the covered and uncovered populations are relatively large. It is important to realize that this condition requires the proportion uncovered must be large relative to the size of the estimates. If the estimate is for a small domain or subgroup, then even a small undercoverage problem can result in important biases if the differences between the covered and uncovered populations are large. Statistics for dropouts from high school, a small subgroup, suffered from this problem (Brick et al. 1992).

About 6.2 percent of households do not have telephones, according to the October 1994 CPS. About 5 percent of adults[1] (civilians age 18 years old or older) lived in nontelephone households according to the November 1994 CPS. These coverage rates suggest that coverage bias could be a problem for household-level estimates from the Screener component of the NHES:96 and also for estimates from the Adult CI component. Before concluding this, the differences in the characteristics of the covered and uncovered populations mus be examined for households and for the civilian adult population.

The bias of an estimate can be expressed mathematically to show the relationships between the bias and the two factors discussed above. The bias is given by

$$Bias(\hat{y}_t) = P_n\left\{E\left(\hat{y}_t - \hat{y}_n\right)\right\} \qquad (1)$$

where $\hat{y}_t$ is the estimated characteristic based on the telephone households only, P_n is the proportion of nontelephone households, $\hat{y}_n$ is the estimated characteristic based on the nontelephone households, and E is the expectation operator for averaging over all possible samples. Estimates of the uncovered proportion of the population for households and for the Adult CI component were given above. In the next section, the differences in the characteristics and estimates of the bias due to undercoverage are presented.

[1]The exact definition of adults used to determine eligibility for the NHES:96 Adult CI interview (civilians 18 or older and not enrolled in elementary or secondary school) could not be used, since the November CPS interview does not contain questions about school enrollment. However, according to estimates from the October 1993 CPS, less than one percent of persons 18 and older are enrolled in elementary or secondary school.

Estimated Differences Between Telephone and Nontelephone Households and Coverage Bias

The differences in the characteristics of persons in telephone and nontelephone households has been explored for a number of topics by different authors. Thornberry and Massey (1988) assessed estimates of health characteristics and found many health and health-related characteristics of persons in nontelephone households were significantly different from those of persons in telephone households. Brick et al. (1992), Brick (1992), Brick and Tubbs (1996), and Brick (1996) studied a variety of estimates for education statistics. They found the differences between persons in telephone and nontelephone households for enrollment statistics were typically smaller than those reported by Thornberry and Massey. However, for some statistics such as those for high school dropouts, the differences were very large. In general, studies have shown that having a telephone is highly related to socioeconomic status and lifestyles (Smith 1990).

The October 1994 CPS was used to examine the extent of the differences in the characteristics of telephone and nontelephone households and of persons in telephone and nontelephone households. The Voting and Registration Supplement to the November 1994 CPS was used to compare characteristics of adults living in telephone and nontelephone households. These files are the most recent data sources containing data relevant to the Screener and Adult CI components of the NHES:96 that are large enough to provide reliable estimates and identify telephone and nontelephone households. For the adults, only a few items about voting and registration are available.

Percentage distributions for characteristics of households and persons in households were tabulated from the October 1994 CPS. Responses of "don't know" and "refused" were excluded from this analysis. The results are given in tables 1 through 8 of the appendix. The first three columns of each table show the estimated percentage distributions for telephone households, nontelephone households, and all households[2]. The fourth column in the tables is the estimated coverage bias, the difference between the estimate for telephone households and the estimate for all households. It is the algebraic equivalent of the bias given by equation (1).

[2]The classification of a household by telephone status was based on the response to the item "Is there a telephone in this house/apartment?"

Household Characteristics

The coverage bias estimates in table 1 reveal some important differences in the characteristics of telephone and nontelephone households. Households without telephones tend to occupy rental units (71 percent), while those with telephones tend to own their homes or have some other arrangement (32 percent rent). About 45 percent of all non-telephone households are located in the South, even though only 35 percent of all households are in the South. Although 82 percent of telephone households are headed by non-black, non-Hispanic persons, only 55 percent of all non-telephone households are headed by non-black, non-Hispanic persons. The majority of households without telephones are single-adult households (53 percent), while only 31 percent of telephone households are single-adult households. Non-telephone households are more likely to have children than telephone households (44 percent of non-telephone households have at least one child, compared to only 37 percent of telephone households).

Table 2 contains estimates for characteristics of persons in households. The characteristics examined were highest grade attended (all persons, and adults only), race/ethnicity (persons born in the U.S. only), and whether all adults in the households speak Spanish only. The absolute value of the coverage bias is greater than 0.5 percent for 21 of the 30 items. The largest coverage bias is -2.9 percent for the estimate of percent of Hispanic adults whose educational attainment is less than 12th grade. Among Hispanic adults in telephone households, 42 percent have educational attainment of less than 12th grade; in non-telephone households, the estimate is 64 percent.

Tables 3, 4, and 5 contain distributions for characteristics of adults in telephone and nontelephone households, by race/ethnicity, region, and home tenure, respectively. Of course, there is variation in the coverage bias across estimates, even within subgroups. To give a general idea of the magnitude of the coverage bias for a subgroup, the median of the absolute value of the coverage bias was computed based on all the estimates for the subgroup. In general, the coverage bias is largest for estimates of educational attainment and marital status. For each race/ethnicity, region, and home tenure category, adults in telephone households have higher educational attainment and are more likely to be married than those in non-telephone households. The median absolute coverage bias is larger for estimates of characteristics of black (0.7 percent) and Hispanic (0.9 percent) adults than for those of nonblack, non-Hispanics (0.3 percent). With a median absolute coverage bias of 0.7 percent, the coverage bias of estimates of characteristics of adults in the South is higher than in other regions. The median absolute coverage bias for renters (0.6 percent) is higher than that for owners and others (0.2 percent).

Tables 6, 7, and 8 give distributions for children ages 3 through 17 in telephone and non-telephone households, by race/ethnicity, region, and home tenure. In general, the coverage bias is largest for estimates of the distribution of race/ethnicity and for estimates of the percentage of children living in single-adult households. For each race/ethnicity category, children in telephone households are less likely to live in a single-adult household, and are more likely to be enrolled in private school. As was the case for adults, the median absolute coverage bias is larger for estimates of characteristics of black and Hispanic children (0.7 percent and 1.0 percent, respectively) than for those of nonblack, non-Hispanic children (0.3 percent). The median absolute coverage bias is larger for estimates of characteristics of children in the Northeast and South (1.1 and 1.0, respectively) than for those in the Midwest and West (0.8 and 0.6, respectively). As with adults, the coverage bias of estimates for children in rented households (median absolute coverage bias of 1.3 percent) is higher than for children in owned/other households (median absolute coverage bias of 0.3 percent).

Civic Involvement

Table 9 presents estimates for adults from the November 1994 CPS Supplement on Voting and Registration. The exact definition of adults used to determine eligibility for the NHES:96 Adult CI interview (civilians 18 years or older and not enrolled in elementary or secondary school) could not be used, since the November CPS interview does not contain questions about school enrollment. Thus, the estimates in table 9 are for civilians 18 years or older, regardless of school enrollment status. However, since less than one percent of persons 18 and older are enrolled in elementary or secondary school (according to estimates from the October 1993 CPS), the population represented in table 9 closely mirrors the population eligible for the NHES:96 Adult CI component. The only civic involvement items relevant to the NHES:96 Adult CI component that appear in the November CPS are questions on voting in the last election and whether the respondent is registered to vote. Although these questions do not exactly match the questions in the Adult CI component, the coverage bias of estimates of these characteristics should give some indication of the potential magnitude of the coverage bias for items from the Adult CI component.

The estimates in table 9 show that the characteristics of adults living in telephone and nontelephone households are often very different. However, the resulting biases are not large because the undercoverage rates are relatively low. These results parallel those given for household characteristics discussed above, but the coverage biases are somewhat larger. Even though adults in telephone households were over twice as likely as those in nontelephone households to have voted in the last election (53 percent and 22 percent, respectively), the bias in the estimate due to undercoverage for

this statistic is 1.4 percent. Even the biases for smaller subgroups with higher undercoverage rates such as Hispanics and non-Hispanic blacks are relatively small, with none of the estimated bias larger than 2.2 percent.

3. Statistical Adjustments of the Estimates

Due to the potential biases resulting from to undercoverage, the standard practice in the NHES is to make statistical adjustments of survey weights to compensate, to the extent possible, for undercoverage. The NHES adjustments that are specifically developed to compensate for the undercoverage are raking or poststratification to known control totals that contain counts of persons living in both telephone and nontelephone households. The goal of these adjustments is to make the estimates from the survey consistent with known totals, to partially correct for undercoverage bias, and to reduce the variance of the estimates.

Four dimensions of raking were used for the household-level weights from the NHES:96. The first dimension was race (white, black, other) of the oldest person in the household. The second dimension was whether or not there were children under 18 years of age present in the household. The third dimension was urbanicity (urban, rural). The fourth dimension was whether the home was rented or owned/other. The NHES:96 household-level weights for each state were raked separately. For the Adult CI component, four dimensions of raking were used: race/ethnicity and household income, age category (18-29 years, 30-49 years, and 50 years or more) and gender, Census region and urbanicity, and home ownership (rented, owned/other). More details on weighting in the NHES:96 are given in Montaquila and Brick (1997).

For this study, as in the study of coverage bias for adults and 0- to 2-year-olds in the NHES:95 (Brick 1996), a procedure was used to produce adjusted weights that can be applied to the telephone households from the CPS to form estimates of all persons. Control totals corresponding to both telephone and nontelephone households were first produced from the October 1994 CPS file[3]. The household weights for the October 1994 CPS telephone households were then raked to these control totals to produce adjusted household weights that summed to the total number of households (both telephone and nontelephone). The responses from telephone households were then used with these adjusted weights to produce adjusted estimates. The adjusted estimates can then be compared to the estimates from all households in the CPS to assess the resulting coverage bias and this should be very similar to the coverage bias found in the NHES estimates. By comparing the coverage bias of the unadjusted estimates from telephone households to the adjusted estimates it is also possible to assess the effectiveness of the raking adjustment.

[3]Although the NHES:96 household-level weights were raked by state, the CPS sample is not designed to produce reliable state-level estimates for every state. Thus, the raking procedure used for the CPS household weights (described here) was done at the national level.

Similarly, control totals of the number of adults in both telephone and nontelephone households were produced from the November 1994 CPS file. The person weights for the November 1994 CPS respondents (adults only) from telephone households were raked to these control totals to produce adjusted person weights that summed to the total number of adults in both telephone and nontelephone households. The responses from adults in telephone households were then used with these adjusted weights to produce adjusted estimates, which were compared to the estimates from all adults in the CPS to assess the resulting coverage bias. This bias should be very similar to the coverage bias found in estimates from the NHES Adult CI component.

For the adult CPS respondents (civilians 18 years or older), the raking dimensions were the same four dimensions as used in the NHES:96, with one exception. The third dimension was Census region alone without urbanicity, since urbanicity is not on the CPS file. The loss of urbanicity from the raking process should have little effect on the bias estimates because this variable was added in the NHES:96 primarily to account for coverage differences due to using a list-assisted method of random digit dialing. The telephone households from the CPS do not result from using a list-assisted sampling method.

Estimates of Coverage Bias After Adjustments

The adjusted weights were applied to the observations from the respondents in telephone households to produce the adjusted estimates shown in the next to last column in tables 1 through 9. The estimated bias in these statistics is given in the last column of these tables. The bias is the difference between the adjusted estimate and the estimate from all households. As before, a negative coverage bias indicates that the estimate based on telephone households is smaller than the estimate based on all households.

Focusing attention on the eight estimates in table 1 that have a coverage bias from telephone households greater than 0.5 percent is useful because these are the statistics that suffer most from coverage bias. The bias of the adjusted estimate is less than or equal to the bias from the unadjusted estimate for all of these estimates. For six of these statistics (all but the estimate of percentage of households in the South and the estimate of percentage of households where the oldest household member is Hispanic) the bias of the adjusted estimate is at least 0.5 percentage points less than the bias of the unadjusted estimate (this ranges from 50 to 62 percent of the estimated bias). The largest coverage bias of the adjusted estimates is for the estimate of percentage of households where the oldest household member is non-black, non-Hispanic, but the bias of the adjusted estimate is only -0.9 percent rather than

the unadjusted bias estimate of -1.7 percent. For the unadjusted estimates, the largest bias is for estimates of home tenure. Since home tenure is used as a raking dimension, no bias remains in the adjusted estimates of home tenure for telephone households. The same is true for the estimates of presence of children and all other variables used in raking, provided the same classifications are used for analysis as were used for raking.

For the statistics in table 2, the bias of the adjusted estimates is less than that of the unadjusted estimates for all but three of the 24 estimates with coverage bias of at least 0.5 percent in absolute value. Tables 3 and 4 demonstrate that for each race/ethnicity group and region, the raking adjustment is effective in reducing the coverage bias for nearly every characteristic examined. For estimates of characteristics by home tenure, raking is not as effective in reducing the coverage bias. However, for adults living in households with owned/other homes, the coverage bias in the estimates tends to be very small (the median absolute coverage bias is 0.2 percent). For adults in households with rented homes, the estimates for telephone and non-telephone households do not differ greatly; the coverage bias is due more to the relatively high percentage of rented households without telephones (12.8 percent of rented households are non-telephone households, compared to 6.2 percent of all households).

As was the case with adults, the raking adjustment reduces the coverage bias of estimates of almost all characteristics of children by race/ethnicity and region (as seen in tables 6 and 7). Table 8 shows that the raking adjustment is more effective in reducing the coverage bias for characteristics of children by home tenure than for adults. The results in table 9 show that the effects of the raking adjustment are mixed. For example, the raking adjustment reduces the coverage bias in estimates of voter participation for Hispanics and for females, but increases the coverage bias in estimates of these characteristics for blacks and for males.

In general, the raking adjustments are effective in reducing the coverage bias of most of the estimates. The largest biases are typically smaller after the raking, with only a few exceptions. The only subgroup examined for whom statistics were not improved by the raking adjustment was adults living in rented homes.

These findings are consistent with the research on the coverage bias in estimates for children for NHES:93 and for children and adults for NHES:95. For the statistics computed for the 1993 study, the adjustments were somewhat effective in reducing bias, but the results were not consistent for all statistics. As in the previous research, the biases for subgroups were generally larger than those across the total population.

4. Conclusions

The analysis shows that the coverage biases for estimates of household characteristics are not very large. For estimates of voter participation of adults, the coverage biases are somewhat larger. This is due mainly to the extreme differences in voter participation characteristics between adults in telephone and nontelephone households. For the questions in the Adult CI component of the NHES:96, the differences in characteristics between telephone and non-telephone households may not be as extreme. Once the weights for the telephone households are raked using variables correlated with the presence of a telephone in the household, the adjusted estimates are typically subject to less bias. In particular, estimates with larger coverage biases are nearly always either reduced or unaffected by the raking adjustment.

The undercoverage bias for some subgroups in the NHES may be more problematic. In this research, the coverage biases for estimates of characteristics of black households and persons (and Hispanic households and persons to a lesser extent) were generally larger than for all households and persons. The coverage bias for estimates of characteristics of renters is generally larger than for all persons or households. The coverage bias is larger for estimates from these subgroups because a larger proportion of persons in these subgroups live in nontelephone households.

No specific rule can handle all the subgroups that may be considered by analysts of the NHES:96, but some guidelines are possible. When dealing with a small subgroup that is likely to be differentially undercovered, analysts need to account for both sampling errors and nonsampling errors. For example, estimates from the NHES for a poorly-covered subgroup such as black adults might be approached differently than analysis of all adults. Analysts might use methods that recognize the estimates are subject to coverage bias by only reporting differences that are both statistically significant and large enough to be important in the presence of moderate coverage bias. The coverage bias can be roughly computed using equation (1) and speculating on the differences between the telephone and nontelephone populations. Therefore, it is recommended that estimated differences between poorly-covered and well-covered groups (such as low and high income households) be considered substantively important only if the differences are larger than both sampling error and potential coverage bias error.

The findings of these and the previous studies of undercoverage bias in the NHES have uniformly shown that telephone data collection is a very cost-effective survey procedure for the populations studied in NHES. The telephone survey approach provides many more observations than would be possible for an in-person interview at the same cost and the added biases in the estimates due to

not sampling nontelephone households are generally small. This feature is especially true for rare subgroups in which screening households in person can be prohibitively expensive.

References

Brick, J.M., (1992). "Undercoverage Bias in Estimates of Characteristics of 3- to 7-year-olds," Appendix H in the National Household Education Survey Methodology Report, unpublished report prepared for the National Center for Education Statistics.

Brick, J. M., and Broene, P. (1997) *Unit and Item Response Rates, Weighting, and Imputation Procedures in the 1995 National Household Education Survey*. NCES Working Paper 97-06. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Brick, J. M., Burke, J., and West, J. (1992). *National Household Education Survey Technical Report No. 2: Telephone Undercoverage Bias of 14- 21-year-olds and 3- to 5-year-olds.* (NCES Publication No. 92-101). Washington, D.C.: U.S. Department of Education, National Center for Education Statistics.

Brick, J. M., and Tubbs, E. (1997). *Telephone Coverage Bias and Recorded Interviews in the 1993 National Household Education Survey*. NCES Working Paper 97-02. Washington, D.C.: U.S. Department of Education, National Center for Education Statistics.

Brick, J. M., Wernimont, J., and Montes, M. (1996). *The 1995 National Household Education Survey: Reinterview Results for the Adult Education Component*. NCES Working Paper No. 96-14. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Collins, M. A., Fleischman, S., Loomis, L. S., and Nicchitta, P. G. (1997). *Design, Data Collection, and Data Editing in the 1995 National Household Education Survey*. NCES Working Paper 97-08. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Collins, M. A., Kim, K., and Loomis, L. S. (1996). *Comparison of Estimates from the 1995 National Household Education Survey*. NCES Working Paper 96-30. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Montaquila, J. M., and Brick, J. M. (1997). *Unit and Item Response Rates, Weighting, and Imputation Procedures in the 1996 National Household Education Survey*. NCES Working Paper 97-40. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Smith, T. W. (1990). "Phone home? An Analysis of Household Telephone Ownership," *International Journal of Public Opinion Research*, 2 (4).

Thornberry, O. T. and Massey, J. T. (1988). Trends in United States Telephone Coverage Across Time and Subgroups, in *Telephone Survey Methodology*. Eds. Groves et al. New York: John Wiley and Sons, pp 25-49.

Vaden-Kiernan, N., Nicchitta, P. G., Montaquila, J. M., and Collins, M. A. (1997). *Design, Data Collection, Interview Administration Time and Data Editing in the 1996 National Household Education Survey*. NCES Working Paper 97-35. Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Appendix

Tables 1 - 9

Table 1.—Estimated percentage of households by telephone status, estimated coverage bias, and adjusted coverage bias

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
Tenure						
Rent home	31.6	70.5	34.0	-2.4	34.0	0.0
Own home or other arrangement	68.4	29.5	66.0	2.4	66.0	0.0
Region						
Northeast	20.2	16.5	20.0	0.2	20.3	0.3
South	34.3	45.2	35.0	-0.7	34.4	-0.6
Midwest	24.1	20.0	23.8	0.3	23.9	0.1
West	21.4	18.3	21.2	0.2	21.4	0.2
Race of oldest person in household						
Black, non-Hispanic	10.7	27.5	11.7	-1.0	12.2	0.5
Hispanic	7.1	17.9	7.9	-0.8	8.4	0.5
Non-black, non-Hispanic	82.1	54.6	80.4	1.7	79.5	-0.9
Adults in household						
Single-adult household	31.3	52.5	32.6	-1.3	31.8	-0.8
Not single-adult household	68.7	47.5	67.4	1.3	68.2	0.8
Presence of children						
At least one child in household	36.7	44.3	37.2	-0.5	37.2	0.0
No children in household	63.3	55.7	62.8	0.5	62.8	0.0

SOURCE: Special tabulations from the October 1994 Current Population Survey.

Table 2.—Estimated percentage of persons in households by telephone status, estimated coverage bias, and adjusted coverage bias

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
Highest grade attended						
All						
less than 12th grade	16.5	30.7	17.4	-0.9	16.6	-0.8
12th grade	24.9	22.0	24.8	0.1	24.8	0.0
some college	35.8	14.0	34.4	1.4	35.5	1.1
Black, non-Hispanic						
less than 12th grade	20.9	28.2	21.9	-1.0	20.8	-1.1
12th grade	22.9	22.1	22.8	0.1	22.8	0.0
some college	27.7	11.3	25.3	2.4	28.9	3.6
Hispanic						
less than 12th grade	32.4	41.8	33.7	-1.3	32.4	-1.3
12th grade	18.1	13.4	17.4	0.7	18.1	0.7
some college	20.1	8.0	18.3	1.8	19.8	1.5
Non-black, non-Hispanic						
less than 12th grade	14.1	26.9	14.6	-0.5	14.0	-0.4
12th grade	26.0	26.1	26.0	0.0	25.9	-0.1
some college	38.7	18.3	37.9	0.8	38.7	0.8
Highest grade attended (adults only)						
All						
less than 12th grade	17.1	42.6	18.5	-1.4	17.3	-1.2
12th grade	34.0	35.1	34.0	0.0	34.0	0.0
some college	48.9	22.3	47.5	1.4	48.8	1.3
Black, non-Hispanic						
less than 12th grade	23.9	41.4	26.1	-2.2	23.9	-2.2
12th grade	34.4	38.7	34.9	-0.5	34.5	-0.4
some college	41.7	19.9	39.0	2.7	41.6	2.6
Hispanic						
less than 12th grade	41.7	63.7	44.6	-2.9	42.0	-2.6
12th grade	27.7	22.6	27.0	0.7	27.7	0.7
some college	30.6	13.7	28.4	2.2	30.3	1.9
Non-black, non-Hispanic						
less than 12th grade	13.8	34.5	14.5	-0.7	13.8	-0.7
12th grade	34.6	38.5	34.7	-0.1	34.5	-0.2
some college	51.6	27.0	50.7	0.9	51.6	0.9
Race/ethnicity (persons born in the U.S. only)						
Black, non-Hispanic	11.6	31.1	12.8	-1.2	12.7	-0.1
Hispanic	5.8	14.2	6.3	-0.5	5.9	-0.4
Non-black, non-Hispanic	82.6	54.7	81.0	1.6	81.4	0.4
Language						
Household has one or more members 15 or older who speaks only Spanish						
Black, non-Hispanic	0.8	0.0	0.7	0.1	0.9	0.2
Hispanic	90.1	94.8	90.9	-0.8	90.2	-0.7
Non-black, non-Hispanic	9.1	5.2	8.4	0.7	8.9	0.5

SOURCE: Special tabulations from the October 1994 Current Population Survey.

Table 3.—Estimated percentage of adults (ages 18 and older) in households by telephone status and estimated coverage bias, overall and by race and ethnicity

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
All adults						
Born in the U.S.	90.7	82.4	90.3	0.4	90.5	0.2
Only Spanish spoken by all adults in HH	1.2	5.0	1.4	-0.2	1.3	-0.1
Race/ethnicity						
Black, non-Hispanic	10.1	25.0	10.9	-0.8	11.0	0.1
Hispanic	8.2	21.7	8.9	-0.7	8.4	-0.5
Non-black, non-Hispanic	81.7	53.2	80.2	1.5	80.6	0.4
Age						
18-24 years	11.9	21.2	12.4	-0.5	12.2	-0.2
25-39 years	32.7	41.7	33.2	-0.5	33.2	0.0
40-54 years	26.9	21.2	26.6	0.3	26.7	0.1
55-69 years	16.6	9.8	16.2	0.4	16.3	0.1
70 years or older	11.9	6.1	11.6	0.3	11.7	0.1
Sex						
Male	46.7	50.7	46.9	-0.2	46.6	-0.3
Female	53.3	49.3	53.1	0.2	53.4	0.3
Educational attainment						
Less than 12th grade	17.1	42.6	18.5	-1.4	17.3	-1.2
12th grade	34.0	35.1	34.0	0.0	34.0	0.0
Some college	48.9	22.3	47.5	1.4	48.8	1.3
Marital status						
Currently married	60.3	37.2	59.1	1.2	59.7	0.6
Not currently married	39.7	62.8	40.9	-1.2	40.3	-0.6
Median absolute coverage bias*				0.5		0.3
Black, non-Hispanic adults						
Born in the U.S.	94.9	94.7	94.9	0.0	94.9	0.0
Only Spanish spoken by all adults in HH	0.1	0.0	0.1	0.0	0.1	0.0
Age						
18-24 years	14.2	20.5	15.0	-0.8	14.4	-0.6
25-39 years	35.7	41.5	36.4	-0.7	36.2	-0.2
40-54 years	26.2	24.3	25.9	0.3	26.0	0.1
55-69 years	15.0	8.5	14.2	0.8	14.7	0.5
70 years or older	8.8	5.3	8.4	0.4	8.7	0.3
Sex						
Male	41.6	45.2	42.0	-0.4	41.3	-0.7
Female	58.4	54.8	58.0	0.4	58.7	0.7
Educational attainment						
Less than 12th grade	23.9	41.4	26.1	-2.2	23.9	-2.2
12th grade	34.4	38.7	34.9	-0.5	34.5	-0.4
Some college	41.7	19.9	39.0	2.7	41.6	2.6
Marital status						
Currently married	40.5	19.2	37.9	2.6	40.0	2.1
Not currently married	59.5	80.8	62.1	-2.6	60.0	-2.1
Median absolute coverage bias*				0.7		0.6

Table 3.—Estimated percentage of adults (ages 18 and older) in households by telephone status and estimated coverage bias, by race and ethnicity—Continued

Characteristic	Telephone households	Non-telephone households	All house-holds	Coverage bias	Adjusted telephone house-holds	Adjusted coverage bias
Hispanic adults						
Born in the U.S.	46.6	36.1	45.2	1.4	46.1	0.9
Only Spanish spoken by all adults in HH	13.7	21.7	14.7	-1.0	13.9	-0.8
Age						
18-24 years	18.7	26.5	19.7	-1.0	18.9	-0.8
25-39 years	39.9	45.2	40.6	-0.7	40.3	-0.3
40-54 years	24.1	18.1	23.3	0.8	23.8	0.5
55-69 years	12.1	8.2	11.6	0.5	11.8	0.2
70 years or older	5.2	2.0	4.8	0.4	5.1	0.3
Sex						
Male	47.0	52.7	47.7	-0.7	46.9	-0.8
Female	53.0	47.3	52.3	0.7	53.1	0.8
Educational attainment						
Less than 12th grade	41.7	63.7	44.6	-2.9	42.0	-2.6
12th grade	27.7	22.6	27.0	0.7	27.7	0.7
Some college	30.6	13.7	28.4	2.2	30.3	1.9
Marital status						
Currently married	57.2	48.3	56.0	1.2	56.8	0.8
Not currently married	42.8	51.7	44.0	-1.2	43.2	-0.8
Median absolute coverage bias*				0.9		0.8
Nonblack, nonHispanic adults						
Born in the U.S.	94.3	93.9	94.3	0.0	94.2	-0.1
Only Spanish spoken by all adults in HH	0.1	0.4	0.2	-0.1	0.1	-0.1
Age						
18-24 years	11.0	19.3	11.3	-0.3	11.2	-0.1
25-39 years	31.6	40.4	31.9	-0.3	32.0	0.1
40-54 years	27.2	21.1	27.0	0.2	27.1	0.1
55-69 years	17.3	11.0	17.0	0.3	17.0	0.0
70 years or older	13.0	8.2	12.8	0.2	12.8	0.0
Sex						
Male	47.3	52.5	47.5	-0.2	47.3	-0.2
Female	52.7	47.5	52.5	0.2	52.7	0.2
Educational attainment						
Less than 12th grade	13.8	34.5	14.5	-0.7	13.8	-0.7
12th grade	34.6	38.5	34.7	-0.1	34.5	-0.2
Some college	51.6	27.0	50.7	0.9	51.6	0.9
Marital status						
Currently married	63.1	41.1	62.3	0.8	62.6	0.3
Not currently married	36.9	58.9	37.7	-0.8	37.4	-0.3
Median absolute coverage bias*				0.3		0.2

*Among characteristics with percentage estimates of at least 2 percent

SOURCE: Special tabulations from the October 1994 Current Population Survey.

Table 4.—Estimated percentage of adults (ages 18 and older) in households by telephone status and estimated coverage bias, by region

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
Northeast						
Born in the U.S.	89.2	75.9	88.7	0.5	88.9	0.2
Only Spanish spoken by all adults in HH	0.9	5.3	1.1	-0.2	1.0	-0.1
Race/ethnicity						
Black, non-Hispanic	9.0	22.1	9.5	-0.5	9.9	0.4
Hispanic	5.7	24.9	6.5	-0.8	5.9	-0.6
Non-black, non-Hispanic	85.4	52.9	84.0	1.4	84.2	0.2
Age						
18-24 years	11.2	15.8	11.4	-0.2	11.4	0.0
25-39 years	31.5	37.0	31.7	-0.2	32.0	0.3
40-54 years	26.3	21.6	26.1	0.2	26.2	0.1
55-69 years	17.8	14.6	17.7	0.1	17.5	-0.2
70 years or older	13.2	11.0	13.1	0.1	13.0	-0.1
Sex						
Male	46.6	49.3	46.7	-0.1	46.4	-0.3
Female	53.4	50.7	53.3	0.1	53.6	0.3
Educational attainment						
Less than 12th grade	16.0	39.0	17.0	-1.0	16.2	-0.8
12th grade	37.1	38.6	37.2	-0.1	37.1	-0.1
Some college	46.9	22.4	45.8	1.1	46.6	0.8
Marital status						
Currently married	57.9	33.6	56.8	1.1	57.2	0.4
Not currently married	42.1	66.4	43.2	-1.1	42.8	-0.4
Median absolute coverage bias*				0.4		0.3
South						
Born in the U.S.	93.1	86.4	92.6	0.5	93.0	0.4
Only Spanish spoken by all adults in HH	1.3	3.7	1.5	-0.2	1.3	-0.2
Race/ethnicity						
Black, non-Hispanic	15.9	34.8	17.2	-1.3	17.2	0.0
Hispanic	8.4	18.3	9.1	-0.7	8.5	-0.6
Non-black, non-Hispanic	75.7	46.9	73.7	2.0	74.3	0.6
Age						
18-24 years	11.8	23.2	12.6	-0.8	12.1	-0.5
25-39 years	32.9	41.6	33.5	-0.6	33.4	-0.1
40-54 years	26.7	21.5	26.3	0.4	26.5	0.2
55-69 years	17.0	8.9	16.5	0.5	16.7	0.2
70 years or older	11.5	4.9	11.1	0.4	11.3	0.2
Sex						
Male	46.1	51.5	46.4	-0.3	45.9	-0.5
Female	53.9	48.5	53.6	0.3	54.1	0.5
Educational attainment						
Less than 12th grade	20.4	48.0	22.3	-1.9	20.5	-1.8
12th grade	33.1	33.3	33.1	0.0	33.1	0.0
Some college	46.5	18.7	44.5	2.0	46.4	1.9
Marital status						
Currently married	61.6	38.3	59.9	1.7	60.8	0.9
Not currently married	38.4	61.7	40.1	-1.7	39.2	-0.9
Median absolute coverage bias*				0.7		0.5

Table 4.—Estimated percentage of adults (ages 18 and older) in households by telephone status and estimated coverage bias, by region—Continued

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
Midwest						
Born in the U.S.	95.9	92.4	95.7	0.2	95.8	0.1
Only Spanish spoken by all adults in HH	0.3	1.9	0.4	-0.1	0.4	0.0
Race/ethnicity						
Black, non-Hispanic	8.3	22.6	8.9	-0.6	9.2	0.3
Hispanic	2.6	8.3	2.9	-0.3	2.7	-0.2
Non-black, non-Hispanic	89.1	69.1	88.2	0.9	88.1	-0.1
Age						
18-24 years	12.3	21.4	12.7	-0.4	12.5	-0.2
25-39 years	32.1	44.4	32.7	-0.6	32.5	-0.2
40-54 years	26.8	19.0	26.4	0.4	26.6	0.2
55-69 years	16.5	8.2	16.1	0.4	16.2	0.1
70 years or older	12.3	6.9	12.1	0.2	12.2	0.1
Sex						
Male	46.9	49.0	47.0	-0.1	46.8	-0.2
Female	53.1	51.0	53.0	0.1	53.2	0.2
Educational attainment						
Less than 12th grade	14.7	35.5	15.6	-0.9	14.8	-0.8
12th grade	37.3	40.5	37.4	-0.1	37.1	-0.3
Some college	48.1	23.9	47.0	1.1	48.1	1.1
Marital status						
Currently married	61.1	33.1	59.8	1.3	60.4	0.6
Not currently married	38.9	66.9	40.2	-1.3	39.6	-0.6
Median absolute coverage bias*				0.4		0.2
West						
Born in the U.S.	82.6	67.9	81.9	0.7	82.2	0.3
Only Spanish spoken by all adults in HH	2.5	10.7	2.9	-0.4	2.6	-0.3
Race/ethnicity						
Black, non-Hispanic	3.9	6.7	4.0	-0.1	4.2	0.2
Hispanic	16.4	40.6	17.5	-1.1	16.6	-0.9
Non-black, non-Hispanic	79.8	52.6	78.4	1.4	79.1	0.7
Age						
18-24 years	12.3	20.6	12.7	-0.4	12.6	-0.1
25-39 years	34.2	43.1	34.6	-0.4	34.7	0.1
40-54 years	27.7	22.6	27.5	0.2	27.5	0.0
55-69 years	15.0	9.6	14.7	0.3	14.6	0.1
70 years or older	10.8	4.0	10.5	0.3	10.6	0.1
Sex						
Male	47.6	51.8	47.8	-0.2	47.6	-0.2
Female	52.4	48.2	52.2	0.2	52.4	0.2
Educational attainment						
Less than 12th grade	15.7	39.7	16.9	-1.2	16.0	-0.9
12th grade	28.8	31.2	28.9	-0.1	28.8	-0.1
Some college	55.5	29.2	54.2	1.3	55.2	1.0
Marital status						
Currently married	60.0	41.6	59.1	0.9	59.5	0.4
Not currently married	40.0	58.4	40.9	-0.9	40.5	-0.4
Median absolute coverage bias*				0.4		0.2

*Among characteristics with percentage estimates of at least 2 percent

SOURCE: Special tabulations from the October 1994 Current Population Survey.

Table 5.—Estimated percentage of adults (ages 18 and older) in households by telephone status and estimated coverage bias, by home tenure

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
Rent						
Born in the U.S.	84.4	79.6	83.8	0.6	84.4	0.6
Only Spanish spoken by all adults in HH	3.0	6.4	3.4	-0.4	3.0	-0.4
Race/ethnicity						
Black, non-Hispanic	16.1	27.5	17.5	-1.4	17.2	-0.3
Hispanic	14.5	25.2	15.8	-1.3	14.4	-1.4
Non-black, non-Hispanic	69.4	47.3	66.6	2.8	68.4	1.8
Age						
18-24 years	19.1	24.5	19.8	-0.7	19.1	-0.7
25-39 years	44.5	44.3	44.5	0.0	44.6	0.1
40-54 years	20.1	19.3	20.0	0.1	20.1	0.1
55-69 years	8.6	7.8	8.5	0.1	8.6	0.1
70 years or older	7.7	4.1	7.3	0.4	7.6	0.3
Sex						
Male	44.9	49.6	45.5	-0.6	44.8	-0.7
Female	55.1	50.4	54.5	0.6	55.2	0.7
Educational attainment						
Less than 12th grade	21.6	44.7	24.5	-2.9	21.7	-2.8
12th grade	32.7	35.1	33.0	-0.3	32.7	-0.3
Some college	45.7	20.2	42.6	3.1	45.6	3.0
Marital status						
Currently married	40.0	31.6	39.0	1.0	40.0	1.0
Not currently married	60.0	68.4	61.0	-1.0	60.0	-1.0
Median absolute coverage bias*				0.6		0.7
Own or some other arrangement						
Born in the U.S.	93.1	88.1	92.9	0.2	93.0	0.1
Only Spanish spoken by all adults in HH	0.6	1.8	0.6	0.0	0.6	0.0
Race/ethnicity						
Black, non-Hispanic	7.8	19.8	8.1	-0.3	8.4	0.3
Hispanic	5.8	14.5	6.0	-0.2	5.8	-0.2
Non-black, non-Hispanic	86.4	65.7	85.9	0.5	85.8	-0.1
Age						
18-24 years	9.2	14.2	9.3	-0.1	9.2	-0.1
25-39 years	28.2	16.3	28.4	-0.2	28.4	0.0
40-54 years	29.4	25.3	29.3	0.1	29.5	0.2
55-69 years	19.7	13.9	19.5	0.2	19.6	0.1
70 years or older	13.5	10.2	13.4	0.1	13.4	0.0
Sex						
Male	47.4	53.0	47.5	-0.1	47.4	-0.1
Female	52.6	47.0	52.5	0.1	52.6	0.1
Educational attainment						
Less than 12th grade	15.4	38.2	16.0	-0.6	15.4	-0.6
12th grade	34.5	35.0	34.5	0.0	34.5	0.0
Some college	50.1	26.8	49.5	0.6	50.1	0.6
Marital status						
Currently married	68.0	49.0	67.6	0.4	68.0	0.4
Not currently married	32.0	51.0	32.4	-0.4	32.0	-0.4
Median absolute coverage bias*				0.2		0.1

*Among characteristics with percentage estimates of at least 2 percent

SOURCE: Special tabulations from the October 1994 Current Population Survey.

Table 6.—Estimated percentage of children (ages 3 through 17) in households by telephone status and estimated coverage bias, overall and by race and ethnicity

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
All children						
Born in the U.S.	96.4	93.3	96.2	0.2	96.3	0.1
Only Spanish spoken by all adults in HH	1.9	4.5	2.1	-0.2	2.0	-0.1
Single-adult household	17.1	40.3	18.9	-1.8	17.9	-1.0
Race/ethnicity						
Black, non-Hispanic	14.0	31.8	15.4	-1.4	15.3	-0.1
Hispanic	11.5	25.0	12.6	-1.1	11.7	-0.9
Non-black, non-Hispanic	74.5	43.2	72.1	2.4	73.0	0.9
School type						
Enrolled in public school	78.1	80.3	78.3	-0.2	78.2	-0.1
Enrolled in private school	13.4	3.2	12.6	0.8	13.2	0.6
Median absolute coverage bias*				1.1		0.6
Black, non-Hispanic children						
Born in the U.S.	98.3	99.4	98.5	-0.2	98.3	-0.2
Only Spanish spoken by all adults in HH	0.1	0.0	0.1	0.0	0.1	0.0
Single-adult household	36.2	54.7	39.1	-2.9	37.1	-2.0
School type						
Enrolled in public school	83.3	83.7	83.4	-0.1	83.4	0.0
Enrolled in private school	9.2	2.2	8.1	1.1	9.1	1.0
Median absolute coverage bias*				0.7		0.6
Hispanic children						
Born in the U.S.	84.5	76.1	83.2	1.3	84.2	1.0
Only Spanish spoken by all adults in HH	15.1	16.8	15.4	-0.3	15.3	-0.1
Single-adult household	17.2	33.6	19.7	-2.5	17.6	-2.1
School type						
Enrolled in public school	79.5	79.1	79.4	0.1	79.5	0.1
Enrolled in private school	8.0	1.7	7.0	1.0	7.8	0.8
Median absolute coverage bias*				1.0		0.8
Nonblack, nonHispanic children						
Born in the U.S.	97.8	98.5	97.9	-0.1	97.7	-0.2
Only Spanish spoken by all adults in HH	0.2	0.8	0.3	-0.1	0.3	0.0
Single-adult household	13.5	33.6	14.4	-0.9	13.9	-0.5
School type						
Enrolled in public school	76.9	78.4	77.0	-0.1	76.9	-0.1
Enrolled in private school	15.0	4.8	14.6	0.4	14.9	0.3
Median absolute coverage bias*				0.3		0.3

*Among characteristics with percentage estimates of at least 2 percent

SOURCE: Special tabulations from the October 1994 Current Population Survey.

Table 7.—Estimated percentage of children (ages 3 through 17) in households by telephone status and estimated coverage bias, by region

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
Northeast						
Born in the U.S.	96.1	90.9	95.8	0.3	95.9	0.1
Only Spanish spoken by all adults in HH	1.3	6.7	1.6	-0.3	1.4	-0.2
Race/ethnicity						
Black, non-Hispanic	11.7	30.2	12.8	-1.1	13.0	0.2
Hispanic	8.4	34.3	9.8	-1.4	8.7	-1.1
Non-black, non-Hispanic	79.9	35.4	77.4	2.5	78.3	0.9
Single-adult household	16.3	48.6	18.1	-1.8	17.1	-1.0
School type						
Enrolled in public school	77.1	78.6	77.2	-0.1	77.1	-0.1
Enrolled in private school	15.4	5.1	14.8	0.6	15.2	0.4
Median absolute coverage bias*				1.1		0.4
South						
Born in the U.S.	97.4	96.1	97.2	0.2	97.3	0.1
Only Spanish spoken by all adults in HH	1.7	2.3	1.8	-0.1	1.7	-0.1
Race/ethnicity						
Black, non-Hispanic	22.0	40.3	23.9	-1.9	23.8	-0.1
Hispanic	10.7	19.9	11.6	-0.9	10.6	-1.0
Non-black, non-Hispanic	67.3	39.8	64.5	2.8	65.6	1.1
Single-adult household	19.7	38.1	21.6	-1.9	20.6	-1.0
School type						
Enrolled in public school	79.8	80.8	79.9	-0.1	80.0	0.1
Enrolled in private school	11.9	2.3	10.9	1.0	11.6	0.7
Median absolute coverage bias*				1.0		0.7
Midwest						
Born in the U.S.	98.1	97.9	98.1	0.0	98.0	-0.1
Only Spanish spoken by all adults in HH	0.7	1.3	0.7	0.0	0.7	0.0
Race/ethnicity						
Black, non-Hispanic	12.2	36.4	13.9	-1.7	13.5	-0.4
Hispanic	4.0	9.6	4.4	-0.4	4.0	-0.4
Non-black, non-Hispanic	83.9	54.0	81.8	2.1	82.5	0.7
Single-adult household	14.8	43.7	16.9	-2.1	15.6	-1.3
School type						
Enrolled in public school	76.4	79.2	76.6	-0.2	76.5	-0.1
Enrolled in private school	15.3	4.0	14.5	0.8	15.1	0.6
Median absolute coverage bias*				0.8		0.4

Table 7.—Estimated percentage of children (ages 3 through 17) in households by telephone status and estimated coverage bias, by region—Continued

Characteristic	Telephone households	Non-telephone households	All house-holds	Coverage bias	Adjusted telephone house-holds	Adjusted coverage bias
West						
Born in the U.S.	93.5	82.9	92.8	0.5	93.3	0.5
Only Spanish spoken by all adults in HH	4.1	12.3	4.6	-0.5	4.2	-0.4
Race/ethnicity						
Black, non-Hispanic	5.8	6.2	5.8	0.0	6.3	0.5
Hispanic	23.3	49.3	25.0	-1.7	23.6	-1.4
Non-black, non-Hispanic	70.9	44.5	69.3	1.6	70.2	0.9
Single-adult household	16.3	35.9	17.5	-1.2	16.8	-0.7
School type						
Enrolled in public school	78.1	81.3	78.3	-0.2	78.1	-0.2
Enrolled in private school	12.1	3.1	11.5	0.6	11.9	0.4
Median absolute coverage bias*				0.6		0.5

*Among characteristics with percentage estimates of at least 2 percent

SOURCE: Special tabulations from the October 1994 Current Population Survey.

Table 8.—Estimated percentage of children (ages 3 through 17) in households by telephone status and estimated coverage bias, by home tenure

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
Rent						
Born in the U.S.	92.7	92.3	92.7	0.0	92.8	0.1
Only Spanish spoken by all adults in HH	4.1	5.6	4.4	-0.3	4.0	-0.4
Race/ethnicity						
Black, non-Hispanic	25.2	34.9	26.9	-1.7	26.7	-0.2
Hispanic	19.4	27.9	20.8	-1.4	19.0	-1.8
Non-black, non-Hispanic	55.4	37.2	52.3	3.1	54.3	2.0
Single-adult household	35.4	47.6	37.5	-2.1	35.7	-2.0
School type						
Enrolled in public school	79.6	80.4	79.7	-0.1	79.7	0.0
Enrolled in private school	8.5	2.4	7.4	1.1	8.5	1.1
Median absolute coverage bias*				1.3		0.8
Own or some other arrangement						
Born in the U.S.	97.9	96.1	97.9	0.0	97.9	0.0
Only Spanish spoken by all adults in HH	1.0	1.3	1.0	0.0	1.0	0.0
Race/ethnicity						
Black, non-Hispanic	9.2	22.8	9.6	-0.4	9.9	0.3
Hispanic	8.2	16.8	8.5	-0.3	8.2	-0.3
Non-black, non-Hispanic	82.6	60.4	81.9	0.7	81.9	0.0
Single-adult household	9.4	19.2	9.6	-0.2	9.4	-0.2
School type						
Enrolled in public school	77.5	79.7	77.5	0.0	77.5	0.0
Enrolled in private school	15.5	5.5	15.2	0.3	15.5	0.3
Median absolute coverage bias*				0.3		0.2

*Among characteristics with percentage estimates of at least 2 percent

SOURCE: Special tabulations from the October 1994 Current Population Survey.

Table 9.—Estimated percentage of adults by telephone status and estimated coverage bias

Characteristic	Telephone households	Non-telephone households	All house-holds	Coverage bias	Adjusted telephone house-holds	Adjusted coverage bias
All adults						
Voted in last election	53.0	22.1	51.6	1.4	53.0	1.4
Currently registered to vote	73.0	44.2	71.6	1.4	72.9	1.3
Born in the U.S.						
Voted in last election	53.3	22.1	51.9	1.4	53.3	1.4
Currently registered to vote	73.4	44.7	72.1	1.3	73.4	1.3
Born outside the U.S.						
Voted in last election	49.2	21.3	48.1	1.1	48.6	0.5
Currently registered to vote	64.8	32.2	63.4	1.4	64.4	1.0
Black, non-Hispanic						
Voted in last election	45.3	26.3	43.1	2.2	45.7	2.6
Currently registered to vote	69.7	51.2	67.5	2.2	70.1	2.6
Hispanic						
Voted in last election	39.1	16.6	36.9	2.2	38.8	1.9
Currently registered to vote	59.7	38.6	57.7	2.0	58.9	1.2
Non-black, non-Hispanic						
Voted in last election	54.9	21.2	53.7	1.2	54.9	1.2
Currently registered to vote	74.2	42.0	73.1	1.1	74.2	1.1
Male						
Voted in last election	53.2	22.8	51.7	1.5	53.6	1.9
Currently registered to vote	72.1	44.0	70.7	1.4	72.4	1.7
Female						
Voted in last election	52.9	21.4	51.5	1.4	52.5	1.0
Currently registered to vote	73.7	44.4	72.4	1.3	73.4	1.0

Table 9.—Estimated percentage of adults by telephone status and estimated coverage bias—Continued

Characteristic	Telephone households	Non-telephone households	All households	Coverage bias	Adjusted telephone households	Adjusted coverage bias
Age 18-24						
Voted in last election	25.7	11.2	24.5	1.2	25.4	0.9
Currently registered to vote	53.0	33.1	51.5	1.5	52.4	0.9
Age 25-39						
Voted in last election	43.8	18.2	42.3	1.5	43.7	1.4
Currently registered to vote	66.4	41.2	64.9	1.5	66.2	1.3
Age 40-54						
Voted in last election	61.2	27.7	59.9	1.3	60.9	1.0
Currently registered to vote	78.8	49.5	77.7	1.1	78.8	1.1
Age 55-69						
Voted in last election	68.2	38.9	67.4	0.8	67.7	0.3
Currently registered to vote	82.8	59.0	82.1	0.7	82.5	0.4
Age 70 or more						
Voted in last election	65.5	36.1	64.7	0.8	64.6	-0.1
Currently registered to vote	83.4	57.3	82.6	0.8	82.9	0.3
Highest grade completed: Less than 12th grade						
Voted in last election	35.1	13.0	32.7	2.4	35.2	2.5
Currently registered to vote	57.4	36.5	55.2	2.2	57.7	2.5
Highest grade completed: 12th grade						
Voted in last election	47.4	21.8	46.0	1.4	47.5	1.5
Currently registered to vote	68.5	41.7	67.1	1.4	68.7	1.6
Highest grade completed: Beyond 12th grade						
Voted in last election	62.6	38.1	62.1	0.5	62.7	0.6
Currently registered to vote	80.9	61.3	80.4	0.5	80.8	0.4

SOURCE: Special tabulations from the November 1994 Current Population Survey.

Listing of NCES Working Papers to Date

Please contact Ruth R. Harris at (202) 219-1831
if you are interested in any of the following papers

Number	Title	Contact
94-01 (July)	Schools and Staffing Survey (SASS) Papers Presented at Meetings of the American Statistical Association	Dan Kasprzyk
94-02 (July)	Generalized Variance Estimate for Schools and Staffing Survey (SASS)	Dan Kasprzyk
94-03 (July)	1991 Schools and Staffing Survey (SASS) Reinterview Response Variance Report	Dan Kasprzyk
94-04 (July)	The Accuracy of Teachers' Self-reports on their Postsecondary Education: Teacher Transcript Study, Schools and Staffing Survey	Dan Kasprzyk
94-05 (July)	Cost-of-Education Differentials Across the States	William Fowler
94-06 (July)	Six Papers on Teachers from the 1990-91 Schools and Staffing Survey and Other Related Surveys	Dan Kasprzyk
94-07 (Nov.)	Data Comparability and Public Policy: New Interest in Public Library Data Papers Presented at Meetings of the American Statistical Association	Carrol Kindel
95-01 (Jan.)	Schools and Staffing Survey: 1994 Papers Presented at the 1994 Meeting of the American Statistical Association	Dan Kasprzyk
95-02 (Jan.)	QED Estimates of the 1990-91 Schools and Staffing Survey: Deriving and Comparing QED School Estimates with CCD Estimates	Dan Kasprzyk
95-03 (Jan.)	Schools and Staffing Survey: 1990-91 SASS Cross-Questionnaire Analysis	Dan Kasprzyk
95-04 (Jan.)	National Education Longitudinal Study of 1988: Second Follow-up Questionnaire Content Areas and Research Issues	Jeffrey Owings
95-05 (Jan.)	National Education Longitudinal Study of 1988: Conducting Trend Analyses of NLS-72, HS&B, and NELS:88 Seniors	Jeffrey Owings

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Number	Title	Contact
95-06 (Jan.)	National Education Longitudinal Study of 1988: Conducting Cross-Cohort Comparisons Using HS&B, NAEP, and NELS:88 Academic Transcript Data	Jeffrey Owings
95-07 (Jan.)	National Education Longitudinal Study of 1988: Conducting Trend Analyses HS&B and NELS:88 Sophomore Cohort Dropouts	Jeffrey Owings
95-08 (Feb.)	CCD Adjustment to the 1990-91 SASS: A Comparison of Estimates	Dan Kasprzyk
95-09 (Feb.)	The Results of the 1993 Teacher List Validation Study (TLVS)	Dan Kasprzyk
95-10 (Feb.)	The Results of the 1991-92 Teacher Follow-up Survey (TFS) Reinterview and Extensive Reconciliation	Dan Kasprzyk
95-11 (Mar.)	Measuring Instruction, Curriculum Content, and Instructional Resources: The Status of Recent Work	Sharon Bobbitt & John Ralph
95-12 (Mar.)	Rural Education Data User's Guide	Samuel Peng
95-13 (Mar.)	Assessing Students with Disabilities and Limited English Proficiency	James Houser
95-14 (Mar.)	Empirical Evaluation of Social, Psychological, & Educational Construct Variables Used in NCES Surveys	Samuel Peng
95-15 (Apr.)	Classroom Instructional Processes: A Review of Existing Measurement Approaches and Their Applicability for the Teacher Follow-up Survey	Sharon Bobbitt
95-16 (Apr.)	Intersurvey Consistency in NCES Private School Surveys	Steven Kaufman
95-17 (May)	Estimates of Expenditures for Private K-12 Schools	Stephen Broughman
95-18 (Nov.)	An Agenda for Research on Teachers and Schools: Revisiting NCES' Schools and Staffing Survey	Dan Kasprzyk
96-01 (Jan.)	Methodological Issues in the Study of Teachers' Careers: Critical Features of a Truly Longitudinal Study	Dan Kasprzyk

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Number	Title	Contact
96-02 (Feb.)	Schools and Staffing Survey (SASS): 1995 Selected papers presented at the 1995 Meeting of the American Statistical Association	Dan Kasprzyk
96-03 (Feb.)	National Education Longitudinal Study of 1988 (NELS:88) Research Framework and Issues	Jeffrey Owings
96-04 (Feb.)	Census Mapping Project/School District Data Book	Tai Phan
96-05 (Feb.)	Cognitive Research on the Teacher Listing Form for the Schools and Staffing Survey	Dan Kasprzyk
96-06 (Mar.)	The Schools and Staffing Survey (SASS) for 1998-99: Design Recommendations to Inform Broad Education Policy	Dan Kasprzyk
96-07 (Mar.)	Should SASS Measure Instructional Processes and Teacher Effectiveness?	Dan Kasprzyk
96-08 (Apr.)	How Accurate are Teacher Judgments of Students' Academic Performance?	Jerry West
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96-10 (Apr.)	1998-99 Schools and Staffing Survey: Issues Related to Survey Depth	Dan Kasprzyk
96-11 (June)	Towards an Organizational Database on America's Schools: A Proposal for the Future of SASS, with comments on School Reform, Governance, and Finance	Dan Kasprzyk
96-12 (June)	Predictors of Retention, Transfer, and Attrition of Special and General Education Teachers: Data from the 1989 Teacher Followup Survey	Dan Kasprzyk
96-13 (June)	Estimation of Response Bias in the NHES:95 Adult Education Survey	Steven Kaufman
96-14 (June)	The 1995 National Household Education Survey: Reinterview Results for the Adult Education Component	Steven Kaufman

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Number	Title	Contact
96-15 (June)	Nested Structures: District-Level Data in the Schools and Staffing Survey	Dan Kasprzyk
96-16 (June)	Strategies for Collecting Finance Data from Private Schools	Stephen Broughman
96-17 (July)	National Postsecondary Student Aid Study: 1996 Field Test Methodology Report	Andrew G. Malizio
96-18 (Aug.)	Assessment of Social Competence, Adaptive Behaviors, and Approaches to Learning with Young Children	Jerry West
96-19 (Oct.)	Assessment and Analysis of School-Level Expenditures	William Fowler
96-20 (Oct.)	1991 National Household Education Survey (NHES:91) Questionnaires: Screener, Early Childhood Education, and Adult Education	Kathryn Chandler
96-21 (Oct.)	1993 National Household Education Survey (NHES:93) Questionnaires: Screener, School Readiness, and School Safety and Discipline	Kathryn Chandler
96-22 (Oct.)	1995 National Household Education Survey (NHES:95) Questionnaires: Screener, Early Childhood Program Participation, and Adult Education	Kathryn Chandler
96-23 (Oct.)	Linking Student Data to SASS: Why, When, How	Dan Kasprzyk
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96-25 (Oct.)	Measures of Inservice Professional Development: Suggested Items for the 1998-1999 Schools and Staffing Survey	Dan Kasprzyk
96-26 (Nov.)	Improving the Coverage of Private Elementary-Secondary Schools	Steven Kaufman
96-27 (Nov.)	Intersurvey Consistency in NCES Private School Surveys for 1993-94	Steven Kaufman

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Number	Title	Contact
96-28 (Nov.)	Student Learning, Teaching Quality, and Professional Development: Theoretical Linkages, Current Measurement, and Recommendations for Future Data Collection	Mary Rollefson
96-29 (Nov.)	Undercoverage Bias in Estimates of Characteristics of Adults and 0- to 2-Year-Olds in the 1995 National Household Education Survey (NHES:95)	Kathryn Chandler
96-30 (Dec.)	Comparison of Estimates from the 1995 National Household Education Survey (NHES:95)	Kathryn Chandler
97-01 (Feb.)	Selected Papers on Education Surveys: Papers Presented at the 1996 Meeting of the American Statistical Association	Dan Kasprzyk
97-02 (Feb.)	Telephone Coverage Bias and Recorded Interviews in the 1993 National Household Education Survey (NHES:93)	Kathryn Chandler
97-03 (Feb.)	1991 and 1995 National Household Education Survey Questionnaires: NHES:91 Screener, NHES:91 Adult Education, NHES:95 Basic Screener, and NHES:95 Adult Education	Kathryn Chandler
97-04 (Feb.)	Design, Data Collection, Monitoring, Interview Administration Time, and Data Editing in the 1993 National Household Education Survey (NHES:93)	Kathryn Chandler
97-05 (Feb.)	Unit and Item Response, Weighting, and Imputation Procedures in the 1993 National Household Education Survey (NHES:93)	Kathryn Chandler
97-06 (Feb.)	Unit and Item Response, Weighting, and Imputation Procedures in the 1995 National Household Education Survey (NHES:95)	Kathryn Chandler
97-07 (Mar.)	The Determinants of Per-Pupil Expenditures in Private Elementary and Secondary Schools: An Exploratory Analysis	Stephen Broughman
97-08 (Mar.)	Design, Data Collection, Interview Timing, and Data Editing in the 1995 National Household Education Survey	Kathryn Chandler

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Number	Title	Contact
97-09 (Apr.)	Status of Data on Crime and Violence in Schools: Final Report	Lee Hoffman
97-10 (Apr.)	Report of Cognitive Research on the Public and Private School Teacher Questionnaires for the Schools and Staffing Survey 1993-94 School Year	Dan Kasprzyk
97-11 (Apr.)	International Comparisons of Inservice Professional Development	Dan Kasprzyk
97-12 (Apr.)	Measuring School Reform: Recommendations for Future SASS Data Collection	Mary Rollefson
97-13 (Apr.)	Improving Data Quality in NCES: Database-to-Report Process	Susan Ahmed
97-14 (Apr.)	Optimal Choice of Periodicities for the Schools and Staffing Survey: Modeling and Analysis	Steven Kaufman
97-15 (May)	Customer Service Survey: Common Core of Data Coordinators	Lee Hoffman
97-16 (May)	International Education Expenditure Comparability Study: Final Report, Volume I	Shelley Burns
97-17 (May)	International Education Expenditure Comparability Study: Final Report, Volume II, Quantitative Analysis of Expenditure Comparability	Shelley Burns
97-18 (June)	Improving the Mail Return Rates of SASS Surveys: A Review of the Literature	Steven Kaufman
97-19 (June)	National Household Education Survey of 1995: Adult Education Course Coding Manual	Peter Stowe
97-20 (June)	National Household Education Survey of 1995: Adult Education Course Code Merge Files User's Guide	Peter Stowe
97-21 (June)	Statistics for Policymakers or Everything You Wanted to Know About Statistics But Thought You Could Never Understand	Susan Ahmed
97-22 (July)	Collection of Private School Finance Data: Development of a Questionnaire	Stephen Broughman

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Number	Title	Contact
97-23 (July)	Further Cognitive Research on the Schools and Staffing Survey (SASS) Teacher Listing Form	Dan Kasprzyk
97-24 (Aug.)	Formulating a Design for the ECLS: A Review of Longitudinal Studies	Jerry West
97-25 (Aug.)	1996 National Household Education Survey (NHES:96) Questionnaires: Screener/Household and Library, Parent and Family Involvement in Education and Civic Involvement, Youth Civic Involvement, and Adult Civic Involvement	Kathryn Chandler
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Number	Title	Contact
97-37 (Nov.)	Optimal Rating Procedures and Methodology for NAEP Open-ended Items	Steven Gorman
97-38 (Nov.)	Reinterview Results for the Parent and Youth Components of the 1996 National Household Education Survey	Kathryn Chandler
97-39 (Nov.)	Undercoverage Bias in Estimates of Characteristics of Households and Adults in the 1996 National Household Education Survey	Kathryn Chandler

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